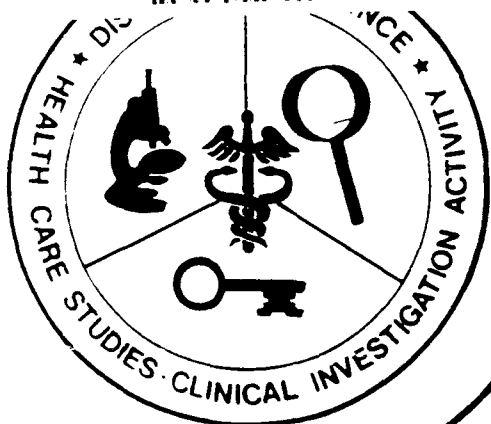


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UNITED STATES ARMY  
HEALTH CARE STUDIES AND  
CLINICAL INVESTIGATION ACTIVITY

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TREATMENT NEEDS OF SOLDIERS IN  
DENTAL FITNESS CLASS 2: A REPORT  
OF CONSULTATION

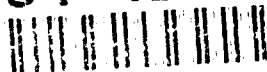
JAY D. SHULMAN, COL, DC  
TIMOTHY R. WILLIAMS, SFC, USA  
BETSY J. OLEXA, SGT, USA  
JAMES A. LALUMANDIER, LTC, DC

Dental Studies Division  
USA Health Care Studies and  
Clinical Investigation Activity  
Fort Sam Houston, Texas

REPORT #CR91-005

1 July 1991

91-12774



UNITED STATES ARMY  
HEALTH SERVICES COMMAND  
FORT SAM HOUSTON, TEXAS 78234



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TREATMENT NEEDS OF SOLDIERS IN DENTAL FITNESS CLASS 2:  
A REPORT OF CONSULTATION

JAY D. SHULMAN, COL, DC  
TIMOTHY R. WILLIAMS, SFC, USA  
BETSY J. OLEXA, SGT, USA  
JAMES A. LALUMANDIER, LTC, DC

Dental Studies Division  
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Treatment Needs of Soldiers in Dental Fitness Class 2:  
A Report of Consultation

Table of Contents

	<u>Page</u>
Executive Summary	1
Background	2
Methods	3
Overview	3
Sampling	3
Record Review	3
Calibration of Reviewers	4
Data Entry and Analysis	4
Results	5
Sample Characteristics	5
Database Construction	5
Treatment Needs	7
Periodontal Treatment	7
Non-periodontal Treatment	7
Consultations	8
Oral Prophylaxis	8
Treatment Time	9
Non-periodontal Treatment Time	9
Periodontal Treatment Time	9
Total Treatment Time	10
Oral Prophylaxis Time	10
Consultation Time	10
Linear Model	11

Sensitivity Analysis	12
Interobserver Reliability	12
Intraobserver Reliability	12
Summary	13
Conclusions	14
Appendices	15
A Letter of Instruction	15
B Treatment Assumptions	17
Acknowledgments	18
References	19
Tables	20

## EXECUTIVE SUMMARY

At the request of the Office of the Chief of the Army Dental Corps the Dental Studies Division of the Health Care Studies and Clinical Investigation Division planned and executed a study to estimate the treatment time necessary to bring soldiers in Dental Fitness Class 2 up to Class 1.

A systematic sample of 962 dental records of soldiers in Class 2 was selected from three clinics at Fort Hood. The records were reviewed by six general dentists and their estimates of periodontal and non-periodontal treatment time were recorded.

Total treatment time ranged from zero to 65 hours with a median of 3.5 hours, a mode of 2 hours, a mean of 5.70 hours, and a standard deviation of 6.05 hours. The majority (88.9 percent) of the sample required some treatment. Periodontal treatment time ranged from zero to 18 hours with a median and mode of zero hours, a mean of 1.18 hours, and a standard deviation of 2.96 hours. Non-periodontal treatment time ranged from zero to 58 hours with a median of 3 hours, a mode of zero hours, a mean of 4.51 hours, and a standard deviation of 5.11 hours. When consultation time is included the total increased to 5.89 hours per soldier.

Oral prophylaxis was needed by 70.7 percent of the sample for a total of 510.0 hours (assuming a 45 minute appointment). At least one consultation was required by 35.4 percent of the sample for a total of 84.0 hours (assuming a 15 minute appointment).

## BACKGROUND

At the request of the Directorate of Dental Services, US Army Health Services Command (Appendix A) the Dental Studies Division of the US Army Health Care Studies and Clinical Investigation Activity (HCSCIA) designed and performed a study to estimate the amount of treatment time required to bring soldiers in Dental Fitness Class 2 to Dental Fitness Class 1.<sup>1</sup> The Fort Hood Dental Activity (DENTAC) was selected as the study site since it maintains the largest number of soldiers' dental records in the Army.

Several studies have assessed the dental treatment needs of active duty military populations. The average number of restorations required per soldier has been found to range from 4.7 to 7.0 (Hobson, 1956; Hellman, Ludwick, and Osterling, 1957; Rovelstad, Irons, McConnell, Hackman, and Collevicchio, 1959; Szmyd and McCall, 1960; Ludwick, 1974; Parker, Schopper, Mangelsdorff, and Cheatham, 1979; Parker, Brunner, and Mangelsdorff, 1981; Christen, Park, Graves, Young, and Rahe, 1977; Cassidy, Parker, and Hutchins, 1973; Spinks and Schneider, 1981).

Hobson (1956) found that the 1956 Army recruit required 4.7 restorations, while Cassidy, Parker, and Hutchins (1973), reported a need for 5.1 restorations per recruit in 1969. Cassidy's finding is similar to that of a Navy study done during the same period, Ludwig, Gendron, Pagas, Weldron (1974) with 5.0 restorations per marine. A 1960 Air Force study of enlisted personnel by Symed and McCall (1960) showed an average need of 5.3 restorations. In 1979, Christen, Park, Graves, Young, and Rahe reported a need for 6.2 restorations per Air Force recruit. [Navy recruits in 1957 (Hellman, Ludwick, Osterling) and 1959 (Rovelstad, Irons, McConnell, Hackman, Collevicchio) needed 6.2 and 7.0 restorations per recruit, respectively (Parker, Schopper, Mangelsdorff, Cheatham, 1979)]. Spinks and Schneider (1981) reported that Navy/Marine recruits required an average of 5.0 restorations. The most recent Army study, by Parker, Brunner, Mangelsdorff (1981) reported that basic trainees required an average of 5.3 restorations. These studies, however, did not address the treatment time necessary to bring a soldier from Class 2 to Class 1.

---

<sup>1</sup>AR 40-35, Preventive Dentistry, 26 March 1987 defines Class 1 as soldiers who require no dental treatment, and Class 2 as soldiers whose existing dental condition is unlikely to result in a dental emergency within 12 months.

## Methods

### Overview

A review of dental records of soldiers in Dental Fitness Class 2 was performed by dental officers and noncommissioned officers (NCOs) at the Fort Hood Dental Activity. The results are reported in terms of estimated dentist treatment time as well as the estimated type and amount of treatment needed.

### Sampling

#### Sample Size.

Since this type of study had not been reported in the literature there was no prior knowledge of the variances in treatment time from which an efficient sample size could be estimated. A minimum sample size was determined based on the investigators' experience and the availability of resources. It was decided that a minimum of 720 records would be reviewed. More records would be reviewed as time permitted.

#### Record Selection.

The sampling frame was all 16,187 records of soldiers in Class 2 in three of the DENTAC's six clinics (60 percent of the DENTAC's 27,072 Class 2 records). Three clinics were selected by the DENTAC Commander to represent Fort Hood in terms of the type of soldier (combat arms, combat support, and combat service support) as well as unit assigned (III Corps Headquarters, 2nd Armored Division, and 1st Cavalry Division). Initially, a probability sample of 720 records was drawn from the Billy Johnson, Fairbanks, and Perkins Dental Clinics. An additional 740 records were selected later for a total of 1,460 records. The number of records selected from each clinic was in proportion to the number of Class 2 dental records they possessed. A systematic sample of every 18th Class 2 record was used. The sampling process is described in the Letter of Instruction (LOI) in Appendix B. Table 1 summarizes the results of the sampling process.

### Record Review

After the records were selected they were reviewed by a dental NCO (MOS 91E) who filled out patient demographic data and treatment needs data from the dental record (SF 603). The LOI (Appendix A) defined each of the data fields and indicated whether it should be completed by the NCO or dentist. After the three NCOs completed their portion of the form, the form and dental record were given to one of six dentists for review and estimation of treatment time required to move the patient from Class 2 to Class 1.

### Calibration of Reviewers

A calibration session was held on 12 Mar 91 at Fort Hood. All participants were given a presentation on the purpose and methods of the study and were given a copy of the LOI.

### Calibration of NCOs.

Nine Class 2 records were reviewed by the NCOs. One investigator analyzed the results and conducted an analysis of variations in data entry and dental record transcription.

### Calibration of Dentists.

After the NCO calibration session was completed the records and data collection forms were reviewed by the six dentists who were selected to be reviewers. The completed data collection forms were reviewed and inter-examiner variations in treatment time estimates were discussed. The reviewers developed a standardized set of estimates of treatment times for commonly performed procedures (Appendix B) to use as a starting point in their estimation process.

### Data Entry and Analysis

Completed data collection forms were sent to HCSCIA and keyed to disk by HCSCIA personnel. The data were analyzed using both the mainframe and PC versions of the Statistical Analysis System.™ Preliminary edits were performed and inconsistent data forms were returned to the Fort Hood Project NCO for verification or correction.

## Results

### Sample Characteristics

A total of 1,460 dental records were reviewed of which 962 (66 percent) were primary reviews (reviewed by only one dentist), 713 (49 percent) were replicates for interobserver reliability (reviewed by more than one dentist), and 35 (2 percent) were replicates for intraobserver reliability (reviewed by the same dentist twice during the study).<sup>2</sup> The 962 primary reviews represent a six percent sample of the 16,187 Class 2 records in the sampling frame and four percent of the 27,072 Class 2 records at Fort Hood.

### Patient Demographics.

Of the 962 primary record reviews 352 (36.6 percent) of the soldiers were from combat arms units,<sup>3</sup> 475 (49.4 percent) were from combat support units,<sup>4</sup> and 118 (14 percent) were from combat service support units.<sup>5</sup> Eight hundred forty-four (87.7 percent) were male while 118 (12.3 percent) were female. The age of the sample ranged from 19 to 58 years with a mean and standard deviation 27.75 and 7.37, respectively, and a median of 26.

### Database Construction

The initial dataset containing data from all reviewed records was subdivided into three files. The intraobserver reliability file contained data from replicate examinations by the same dentist and the interobserver reliability file contained data from replicate examinations by more than one dentist. The primary database contained data from records reviewed by one dentist. Where more than one dentist reviewed a record a composite record was created

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<sup>2</sup>The total exceeds 100 percent because some records were used for more than one purpose.

<sup>3</sup>Those units or organizations whose primary mission is destruction of enemy forces and/or installations, such as infantry, air defense artillery, field artillery, armor, aviation, special forces, and combat engineers.

<sup>4</sup>Combat support is operational assistance (including direct combat involvement) furnished combat elements by other designated units such as signal, military police, chemical, and military intelligence.

<sup>5</sup>Combat service support is the assistance provided to operating forces primarily in the fields of administrative services, chaplain services, civil affairs, finance, legal services, health services, military police, supply, management, maintenance, transportation, construction engineers, acquisitions, engineering functions, food services, graves registration, laundry, dry cleaning, bath, property disposal, and other logistic services.

accepting all the data from the first record entered with the exception of periodontal and non-periodontal treatment time. These data elements were replaced by their mean values. Where a dentist reviewed the same record twice during the study only the first review was incorporated into the primary database.

## Treatment Needs

### Periodontal Treatment

Table 2 shows the number of sextants of periodontal treatment required. While 83.5 percent required no periodontal treatment the majority of those needing treatment had four or more sextants to be treated. The proportion requiring no treatment did not differ appreciably by sex (83.1 for women and 83.6 for men) or unit (81.5 percent for combat service support, 83.5 percent for combat, and 84.0 for combat support units).

### Non-Periodontal Treatment

Table 3 shows 53.3 percent of the sample needed at least one restoration. Of those needing treatment, the majority needed two or fewer restorations. The proportion needing restorative treatment did not differ appreciably by unit (56.3 percent for combat service support, 55.6 percent for combat support, and 50.8 for combat) or sex (59.8 percent for women and 52.4 percent for men).

### Crowns.

Table 4 shows that 83.8 percent did not need crowns. Of those needing crowns most needed only one. The proportion requiring no crowns did not vary appreciably among units (82.4 for combat, 84.4 for combat support, and 85.1 for combat service support) or sex (82.2 for women and 84.0 for men).

### Fixed Partial Dentures.

Table 5 shows that 12.9 percent of the sample needed fixed partial dentures. Fixed partial denture needs did not differ by unit (14.8 percent for combat service support, 13.6 percent for combat, and 11.8 percent for combat support) but did differ by sex (20.4 percent for women versus 11.9 percent for men).<sup>6</sup>

### Removable Partial Dentures.

Table 6 shows that 5.6 percent of the sample needed removable partial dentures. This proportion did not differ appreciably by unit (6.3 percent for combat, 5.9 percent for combat support, and 5.6 percent for combat service support) but did by sex (9.3 percent for women and 4.9 percent for men).<sup>7</sup>

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<sup>6</sup>p < .05 (two-tailed).

<sup>7</sup>Not significant at .05 level (two-tailed).

### Endodontic Treatment.

Table 7 shows that only four percent of the sample needed endodontic treatment and that virtually all those needing endodontic treatment had only one tooth to be treated. The low prevalence of endodontic treatment need held over unit (5.2 percent for combat service support, 4.8 percent for combat, and 2.9 percent for combat support). Women had a slightly higher but statistically significant<sup>8</sup> prevalence of endodontic need (5.9 percent) than men (3.7 percent).

### Third Molar Extractions.

Table 8 shows that 67.2 percent of the sample had no third molars requiring extraction. This proportion did not differ appreciably with sex (66.6 percent for women versus 66.9 percent for men) and unit (64.4 percent for combat support, 68.9 percent for combat service support, and 70.2 percent for combat units).

### Consultations

Consultations were needed by 35.3 percent of the soldiers (Table 9). The proportion of soldiers requiring consultations differed among the sexes (45.0 percent for women versus 31.6 percent for men) but differed less among units (60.8 percent for combat support, 66.0 for combat service support, and 69.3 percent for combat units).

### Oral Prophylaxis

Table 10 shows that the majority (70.7 percent) of the sample needed a prophylaxis. The proportion of soldiers requiring a prophylaxis was not appreciably different among units (69.9 percent for combat support, 70.5 percent for combat, and 74.1 percent for combat service support) or sex (71.3 percent for men and 66.1 percent for women).<sup>9</sup>

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<sup>8</sup>p < .05 (two-tailed).

<sup>9</sup>Not significant at .05 level (two-tailed).

## Treatment Time

Treatment time estimates relate solely to dentist time and exclude time required by dental assistants, laboratory technicians, and hygienists.

### Non-Periodontal Treatment Time

Non-periodontal treatment time ranged from zero to 58 hours with a median of 3 hours, a mode of zero hours, a mean of 4.51 hours and a standard deviation of 5.11 hours. Table 11 shows the distribution of non-periodontal treatment time. The majority (86.7 percent) of the sample required restorative prosthetic or exodontia treatment.

Table 12 shows non-periodontal treatment time by age. The proportion of soldiers requiring treatment was highest (90 percent) in those under 23 and lowest in those 33 to 37 (83.2 percent). The age-group specific mean ranged from 3.56 hours in soldiers under 23 to 5.90 hours in the over 37 group (Table 13). The Pearson product-moment correlation between age and treatment time was weak (.115) but statistically different from zero ( $p < .0001$ ).

Table 14 shows non-periodontal treatment time by unit. The proportion of soldiers requiring treatment and the proportion requiring extensive treatment were not appreciably different. Mean treatment time (Table 15) for units ranged from 4.27 (combat support) to 4.8 hours (combat).

Table 16 shows non-periodontal treatment time by sex. A greater proportion (28.4 percent) of males require less than 3 hours of treatment than females (18.7 percent). A greater proportion of females (36.4 percent) require more than six hours of treatment than males (20.3 percent). The mean treatment time for females (5.68) was higher than that of males (4.36) (Table 17).

### Periodontal Treatment Time

Table 18 shows the distribution of periodontal treatment time. Only 18.9 percent of the sample required periodontal treatment. Treatment time ranged from zero to 18 hours with a median and mode of zero, a mean of 1.18, and a standard deviation of 2.96 hours.

Table 19 shows the distribution of periodontal treatment time by unit type. The proportion requiring treatment did not vary substantially among units; 18.0 percent in combat support, 18.6 percent in combat, and 23.0 percent in combat service support units. Mean treatment time ranged from 1.06 in combat to 1.20 in combat support, to 1.45 hours in combat service support units.

Table 20 shows the distribution of periodontal treatment time by age. The proportion requiring treatment increases steadily with age: from 6.4 percent of those under 23 to percent of those over 37. The Pearson product-moment correlation between treatment time and age was weak (.324) and significantly different from zero ( $p < .0001$ ).

Table 21 shows the distribution of periodontal treatment time by sex. The proportion requiring treatment does not vary appreciably between males (19 percent) and females (18.1 percent). Of those requiring treatment a greater proportion of women (8.6 percent) needed more than eight hours of treatment than men (4.2 percent).

### Total Treatment Time

Total treatment time is the sum of non-periodontal treatment time and periodontal treatment time. It ranged from zero to 65 hours with a median of 3.5, a mode of 2, a mean of 5.70 and a standard deviation of 6.05. Table 22 shows the distribution of total treatment time. The majority (88.9 percent) of the sample required some treatment.

Table 23 shows the distribution of total treatment time by unit type. Soldiers in combat units had the largest proportion requiring treatment (90.6 percent), followed by combat support (88.4 percent), and combat service support (86.7 percent). Mean treatment time was 5.46 in combat support, 5.87 in combat, and 6.13 hours in combat service support units.

Table 24 shows the distribution of total treatment time by age. The age-group specific mean ranged from 3.91 hours in soldiers under 23 to 9.31 hours in the over 37 group (Table 13). The Pearson product-moment correlation between total treatment time and age was weak (.256) and significantly different from zero ( $p < .0001$ ).

Table 25 shows total treatment time by sex. A greater proportion of females (32.7 percent) require more than 10 hours of treatment than males (15.8 percent). The mean treatment time for females (7.19) was higher than that of males (5.50).

### Oral Prophylaxis Treatment Time

Estimates of periodontal and non-periodontal treatment time did not include the time required for an oral prophylaxis. Based on 45 minutes per prophylaxis 510.0 hours of prophylaxis time are required.

### Consultation Time

The dentists reviewing the records recorded the number of consultations required but did not include the time for the consultations in their treatment time estimates. Based on 15 minutes per consultation 84.0 hours of consultation time are required.

## Linear Model

Previous univariate comparisons of treatment time by unit, sex, and age did not adjust for their joint effect. For example, treatment time differences between combat, combat support, and combat service support units (Table 15) could potentially be an artifact of the sex composition of the units. Multivariate analysis of variance models<sup>10</sup> were tested. The variables used were age, sex, unit, and a sex-unit interaction term for periodontal, non-periodontal, and total treatment time.

### Periodontal Treatment Time.

The model was weak, explaining only a small proportion of the variation in treatment time ( $R^2=.112$ ). Age was the only variable that was statistically significant ( $p < .0001$ ).

### Non-Periodontal Treatment Time.

The model was extremely weak, explaining a tiny proportion of the variation in treatment time ( $R^2=.028$ ). Age ( $p < .0001$ ) and sex ( $p < .001$ ) were statistically significant.

### Total Treatment Time

The model was weak explaining only a small proportion of the variation in treatment time ( $R^2=.081$ ). Age ( $p < .0001$ ) and sex ( $p < .0084$ ) were statistically significant.

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<sup>10</sup>Statistical Analysis System, PROC GLM™.

## Sensitivity Analysis

While diagnosis and treatment planning involve many widely accepted decision rules there is still room for substantial variation. In a categorical index such as decayed, missing, and filled teeth, for example, there is a small number of possible categories for each tooth. Estimating treatment time is far more complex. It involves reviewing the results of last examination in the dental record, determining whether a procedure treatment planned has been completed, developing the treatment plan, and determining treatment time. At every stage there is room for variation. The potential for variation increases with the complexity of the decision and the number of decisions that have to be made. In addition, the treatment plan is weighted by time which introduces further variation. For example, a multi-surface restoration takes substantially less time to complete than a crown. The economies of scale related to quadrant dentistry introduce further variation. These differences will result in substantial variation in treatment time between examiners.

### Interobserver Reliability

Reliability was measured using a one way analysis of variance (ANOVA) with the reviewing dentist as the independent variable.<sup>11</sup> The proportion of the variance in periodontal and non-periodontal treatment time ( $R^2$ ) as well as the significance of differences in interobserver means were determined.

#### Periodontal Treatment Time.

A one way ANOVA showed significant differences between reviewing dentists ( $p < .0006$ ) although the proportion of variation attributable to the differences was small ( $R^2 = .03$ ).

#### Non-periodontal-Treatment-Time.

A one way ANOVA showed significant differences between reviewing dentists ( $p < .0184$ ) although the proportion of variation attributable to the differences was small ( $R^2 = .019$ ).

---

<sup>11</sup>The kappa statistic was not used because of clustering of observations at the margins of the reliability matrix.

### Intraobserver Reliability

A one way ANOVA with the patient as the independent variable was performed. The proportion of the variance in periodontal and non-periodontal treatment time ( $R^2$ ) as well as the significance of differences in interobserver means were determined.

#### Periodontal Treatment Time.

A one way ANOVA showed that differences between patients accounted for most of the variation in periodontal treatment time. For all dentists  $R^2$  was greater or equal to .937 with the significance of the differences between means ranging from  $p < .0015$  to  $p < .01$ .

#### Non-periodontal Treatment Time.

A one way ANOVA showed that differences between patients accounted for most of the variation in non-periodontal treatment time. The  $R^2$  for one dentist was .510 while that of the other five ranged from .966 to 1.00. The significance of the differences between means ranged from  $p < .390$  to  $p < .0001$ .

### Summary

There was substantial inter-observer variability in estimating periodontal and non-periodontal treatment time. This variability increased with treatment needs. There was consistent agreement between dentists when the records indicated minimal or no treatment but agreement dropped appreciably as needs increased and the treatment plan became more complex. This is not surprising since complex cases often have clinically alternative treatment plans that are associated with different levels of effort. Despite the increased inter-observer variation for patients with greater treatment needs the majority of the variation was still due to differences between patients rather than between observers.

## Conclusions

The amount of dentist time (including consultations) required to bring the sample from Class 2 to Class 1, was substantial; 5.81 hours per soldier. Of this, 1.18 hours (20 percent) was periodontal treatment. When consultation time is added dentist treatment time increases to 5.89 hours. Periodontal treatment time increased with age. In addition to increasing with age, non-periodontal treatment time was greater among women. These differences were small, but statistically significant.

## Appendix A

### MEMORANDUM FOR Dental Officers and Dental NCOs

Subject: Letter of Instruction for Administering the Manhours Required to Move Class 2 Soldiers to Class 1 Survey Form

#### 1. General Instructions

- a. Fill out forms in #2 pencil only.
- b. DDS should spot check completed forms on a random basis.
- c. One form per record reviewed.
- d. One form per 18th record. If 18th record is other than class 2, go to next class 2 record. Restart count from that record.

#### 2. Fill out each block of form as indicated below:

Time in Hours (DDS)	Time in half hour increments. Best estimate of amount of dentist treatment time to include general dentist, estimate of specialty consultation, and specialty dentist treatment time (without X2s).
Provider ID (NCO)	Dentist's last initial and last four of social security number.
Unit Type (NCO)	Enter type of unit: C for combat arms units, i.e., armor, infantry, artillery, etc. CS for combat support units, i.e., signal, chemical, ordnance CSS for combat service support units, i.e., medical, dental, supply
Patients Last Four (NCO)	Enter patient's last four from terminal digit folder.
Sex (NCO)	Enter M or F.
Year of Birth (NCO)	Enter the Year of birth , i.e., 55 (for 1955), 72 (1972).

Date of Most Recent PANO (NCO)	Enter the numerical Number for Date, i.e., 03 90 (March 1990)
Year of Most Recent PANO (NCO)	Enter the numerical Number for year, i.e., 90 (1990)
Number of Teeth Requiring Restorations (NCO)	Enter the Number of Teeth requiring restorations as indicated in block #16 of SF 603.
Prophy Required (NCO)	Enter Y if prophy is indicated in Remarks section of SF 603.
Sextants of Perio Therapy (DDS)	Enter the number of sextants requiring perio therapy, i.e., deep scaling or curettage to periodontal surgery.
Number of Teeth Requiring Endontic Treatment (NCO)	Enter the number of teeth requiring Endodontic treatment as indicated in block #16 or remarks of SF 603.
Number of Teeth Requiring Crowns Treatment (NCO)	Enter the number of teeth requiring single unit crowns as indicated in block #16 or remarks of SF 603.
Number of Units of Removable Partial Dentures Required (NCO)	Enter the number of removable partial dentures required as indicated in block #16 or remarks of SF 603.
Number of Units of Fixed Partial Dentures Required (NCO)	Enter the number of fixed partial dentures required as indicated in block #16 or remarks of SF 603.
Number of Teeth Impacted Requiring Removal (NCO)	Enter the number of impacted teeth requiring extraction as indicated in block 16 or remarks of SF 603.
Number of Consultations Required (DDS)	Enter number of specialty consults required.

## APPENDIX B

### Treatment Assumptions - Class 2 Survey, Ft. Hood

- |    |  |   |
|----|--|---|
| 1. | Single Unit Crown                          | 4 hours treatment time required.                |
| 2. | Removable Prosthetics<br>(Denture/Partial) | 7 hours treatment time required.                |
| 3. | Fixed Bridge (3 unit)                      | 6 hours treatment time required.                |
| 4. | Endo (Anterior)                            | 2 hours treatment time required.                |
| 5. | Endo (Posterior)                           | 4 hours treatment time required.                |
| 6. | Perio Surgery                              | 2 hours treatment time required per<br>sextant. |
| 7. | Operative                                  | 4 surfaces per hour of treatment<br>time.       |
| 8. | Surgery (Impactions)                       | 1 hour treatment time required per<br>sextant.  |

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Table 1  
Results of Sampling Process (N = 962)

Clinic	Class 2 Records	Records Sampled	Percent Sampled
Billy Johnson	7,301	586	61
Fairbanks	1,836	153	16
Perkins	7,050	218	23
Total	16,187		

Table 2

## Sextants of Periodontal Treatment Required (N=962)

Number of Sextants	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	803	83.5	803	83.5
1	13	1.4	816	84.8
2	13	1.4	829	86.2
3	9	0.9	838	87.1
4	47	4.9	885	92.0
5	4	0.4	889	92.4
6	73	7.6	962	100.0

Table 3

## Restorations Required (N=962)

Number of Restorations	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	448	46.7	448	46.7
1	156	16.3	604	62.9
2	129	13.4	733	76.4
3	68	7.1	801	83.4
4	52	5.4	853	88.9
5	29	3.0	882	91.9
6	27	2.8	909	94.7
7	21	2.2	930	96.9
8	8	0.8	938	97.7
9	8	0.8	946	98.5
10	5	0.5	951	99.1
11	5	0.5	956	99.6
12	2	0.2	958	99.8
14	2	0.2	962	100.0

Table 4

## Crowns Required

Number of Crowns	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	806	83.8	806	83.8
1	106	11.0	912	94.8
2	35	3.6	947	98.4
3	13	1.4	960	99.8
4	1	0.1	961	99.9
15	1	0.1	962	100.0

Table 5  
Fixed Partial Dentures Required (N=962)

Number of Dentures	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	838	87.1	838	87.1
1	91	9.5	929	96.6
2	27	2.8	956	99.4
3	2	0.2	958	99.6
4	4	0.4	962	100.0

Table 6  
Removable Partial Dentures Required (N=962)

Number of Dentures	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	908	94.4	908	94.4
1	33	3.4	941	97.8
2	21	2.2	962	100.0

Table 7  
Endodontic Treatment Required (N=962)

Number of Teeth	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	924	96.0	924	96.0
1	33	3.4	957	99.5
2	4	0.4	961	99.9
3	1	0.1	962	100.0

Table 8  
Impacted Third Molars To Be Extracted (N=962)

Number of Impactions	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	646	67.2	646	67.2
1	54	5.6	700	72.8
2	87	9.0	787	81.8
3	42	4.4	829	86.2
4	133	13.8	962	100.0

Table 9

Consultations Required (N=962)

Number of Consultations	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	622	64.7	622	64.7
1	287	29.8	909	94.5
2	50	5.2	959	99.7
3	2	0.2	961	99.9
5	1	0.1	962	100.0

Table 10  
Oral Prophylaxis Needs (N=962)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	680	70.7	680	70.7
No	282	29.3	962	100.0

Table 11

Non-Periodontal Treatment Time (N=962)

Hours	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	128	13.3	128	13.3
.5 - 1.0	134	13.9	262	27.2
1.5 - 3.0	285	29.6	547	56.9
3.5 - 6.0	175	18.2	722	75.1
6.5 -10.0	135	14.0	857	89.1
over 10	105	10.9	962	100.0

Table 12  
Non-Periodontal Treatment Time  
by Age (N=962)

	≤ 23	23-26	27-32	33-37	< 37
Hours	n (%)	n (%)	n (%)	n (%)	n (%)
0	25 (10.0)	32 (11.9)	37 (16.4)	18 (16.8)	15 (14.3)
0.5 - 1.0	28 (11.2)	40 (14.8)	34 (15.0)	21 (19.6)	11 (10.5)
1.5 - 3.0	115 (45.8)	84 (31.1)	45 (19.9)	15 (14.0)	24 (22.9)
3.5 - 6.0	49 (19.5)	45 (16.7)	42 (18.6)	19 (17.8)	20 (19.1)
6.5 -10.0	19 ( 7.6)	37 (13.7)	41 (18.1)	21 (19.6)	17 (16.2)
over 10.0	15 ( 6.0)	32 (11.9)	27 (12.0)	13 (12.2)	18 (17.1)
Total	251 (26.2)	270 (28.2)	226 (23.6)	107 (11.2)	105 (11.0)

Table 13

Age Group-Specific Treatment Time Means  
and Standard Deviations (N=962)

Age Group	Treatment Time					
	Periodontal		Non-periodontal		Total	
	Mean	Std	Mean	Std	Mean	Std
under 23	0.35	1.74	3.56	3.70	3.91	4.12
23 - 26	0.55	2.22	4.57	5.20	5.13	5.74
27 - 32	1.36	3.14	4.77	4.79	6.12	5.55
33 - 37	2.20	3.37	4.86	5.50	7.06	6.78
over 37	3.41	4.43	5.90	7.37	9.31	8.65

Table 14

Non-Periodontal Treatment Time  
by Unit (N=962)

Hours	Combat		Combat Support		Combat Service Support	
	n	%	n	%	n	%
0	45	12.8	63	13.3	20	14.8
.5 - 1.0	46	13.1	68	14.3	20	14.8
1.5 - 3.0	99	28.1	145	30.5	41	30.4
3.5 - 6.0	61	17.3	97	20.4	17	12.3
6.5 -10.0	61	17.3	58	12.2	16	11.9
over 10.0	40	11.4	44	9.3	21	15.6

Table 15

Unit-Specific Treatment Time Means  
and Standard Deviations (N=962)

Age Group	Treatment Time					
	Periodontal		Non-periodontal		Total	
	Mean	Std	Mean	Std	Mean	Std
Combat	1.06	2.67	4.80	5.09	5.87	5.86
Combat Support	1.20	3.09	4.27	5.16	5.46	6.20
Combat Svc. Support	1.45	3.28	4.68	5.04	6.13	6.06

Table 16

Non-Periodontal Treatment Time  
by Sex (N=962)

Hours	Male		Female	
	Frequency	Percent	Frequency	Percent
0	116	13.7	12	10.2
.5 - 1.0	124	14.7	10	8.5
1.5 - 3.0	250	29.6	35	29.7
3.5 - 6.0	157	18.6	18	15.3
6.5 -10.0	116	13.7	19	16.1
over 10.0	81	9.6	24	20.3

Table 17

Sex-Specific Treatment Time Means  
and Standard Deviations (N=962)

Age Group	Treatment Time					
	Periodontal		Non-periodontal		Total	
	Mean	Std	Mean	Std	Mean	Std
Male	1.14	2.87	4.36	5.07	5.50	6.00
Female	1.45	3.63	5.68	5.34	7.19	6.28

Table 18

## Periodontal Treatment Time (N=958)

Hours	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	777	81.1	777	81.1
.5 - 2.0	28	2.9	805	84.0
2.5 - 4.0	49	5.1	854	89.1
4.5 - 6.0	23	2.4	877	91.5
6.5 - 8.0	31	3.2	908	94.8
8.5 -10.0	20	2.1	928	96.9
10.5-12.0	21	2.2	949	99.1
over 12.0	9	0.9	958	100.0

Table 19

Periodontal Treatment Time  
by Unit (N=962)

Hours	Combat		Combat Support		Combat Service Support	
	n	%	n	%	n	%
0	285	81.4	388	82.0	104	77.0
.5 - 2.0	12	3.4	9	1.9	7	5.2
2.5 - 4.0	17	4.9	27	5.7	5	3.7
4.5 - 6.0	11	3.1	8	1.7	4	3.0
6.5 - 8.0	9	2.6	18	3.8	4	3.0
8.5 -10.0	8	2.3	5	1.1	7	5.2
10.5-12.0	7	2.0	12	2.5	2	1.5
over 12.0	1	0.3	6	1.3	2	1.5

Table 20

Periodontal Treatment Time  
by Age (N=962)

	≤ 23	23-26	27-32	33-37	< 37
Hours	n (%)	n (%)	n (%)	n (%)	n (%)
0	235 (93.6)	246 (91.5)	173 (77.5)	65 (60.8)	55 (52.4)
.5 - 2.0	3 ( 1.2)	4 ( 1.5)	8 ( 3.6)	8 ( 7.5)	5 ( 4.8)
2.5 - 4.0	6 ( 2.4)	8 ( 3.0)	16 ( 7.2)	10 ( 9.4)	9 ( 8.6)
4.5 - 6.0	2 ( 0.8)	2 ( 0.7)	6 ( 2.7)	5 ( 4.7)	8 ( 7.6)
6.5 - 8.0	2 ( 0.8)	1 ( 0.4)	7 ( 3.1)	11 (10.3)	10 ( 9.5)
8.5 -10.0	1 ( 0.4)	3 ( 1.1)	4 ( 1.8)	6 ( 5.6)	6 ( 5.7)
10.5-12.0	1 ( 0.4)	2 ( 0.7)	6 ( 2.7)	2 ( 1.9)	10 ( 9.5)
over 12.0	1 ( 0.4)	3 ( 1.1)	3 ( 1.4)	0 ( 0.0)	2 ( 1.9)
Total	251 (26.3)	269 (28.2)	223 (23.4)	107 (11.2)	105 (11.0)

Table 21  
Periodontal Treatment Time  
by Sex (N=962)

Hours	Male		Female	
	Frequency	Percent	Frequency	Percent
0	682	81.0	95	81.9
.5 - 2.0	27	3.2	1	0.9
2.5 - 4.0	44	5.2	5	4.3
4.5 - 6.0	20	2.4	3	2.6
6.5 - 8.0	29	3.4	2	1.7
8.5 -10.0	15	1.8	5	4.3
10.5-12.0	19	2.3	2	1.7
over 12.0	6	0.7	3	2.6

Table 22  
Total Treatment Time (N=958)

Hours	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	106	11.1	106	11.1
.5 - 2.0	248	25.9	354	37.0
2.5 - 4.0	188	19.6	542	56.6
4.5 - 6.0	93	9.7	635	66.3
6.5 - 8.0	91	9.5	726	75.8
8.5 -10.0	62	6.5	788	82.3
10.5-12.0	48	5.0	836	87.3
12.5-15.0	51	5.3	887	92.6
15.5-20.0	48	5.0	935	97.6
20.5-25.0	16	1.7	951	99.3
25.5-30.0	3	0.3	954	99.6
over 30.0	4	0.4	958	100.0

Table 23

Total Treatment Time  
by Unit (N=962)

Hours	Combat		Combat Support		Combat Service Support	
	n	%	n	%	n	%
0	33	9.4	55	11.6	18	13.3
.5 - 2.0	99	28.3	114	24.1	35	25.9
2.5 - 4.0	53	15.1	109	23.0	26	19.3
4.5 - 6.0	36	10.3	50	10.6	7	5.2
6.5 - 8.0	47	13.4	39	8.3	5	3.7
8.5 -10.0	20	5.7	31	6.6	11	8.2
10.5-12.0	16	4.6	25	5.3	7	5.2
12.5-15.0	18	5.1	50	10.6	11	8.1
15.5-20.0	19	5.4	18	3.8	11	8.1
20.5-25.0	7	2.0	5	1.1	4	3.0
25.5-30.0	1	0.3	2	0.4	0	0.0
over 30.0	1	0.3	3	0.6	0	0.0

Table 24

Total Treatment Time  
by Age (N=962)

	≤ 23	23-26	27-32	33-37	< 37
Hours	n (%)	n (%)	n (%)	n (%)	n (%)
0	24 ( 9.6)	28 (10.4)	29 (13.0)	17 (15.9)	7 ( 6.7)
0.5 - 2.0	91 (36.3)	82 (30.5)	43 (19.3)	16 (15.0)	15 (14.3)
2.5 - 4.0	67 (26.7)	60 (22.3)	35 (15.7)	13 (12.2)	12 (11.4)
4.5 - 6.0	27 (10.8)	22 ( 8.2)	23 (10.3)	6 ( 5.6)	15 (14.3)
6.5 - 8.0	15 ( 6.0)	25 ( 9.3)	25 (11.2)	16 (15.0)	10 ( 9.5)
8.5 -10.0	8 ( 3.2)	12 ( 4.5)	24 (10.8)	14 (13.1)	4 ( 3.8)
10.5-12.0	5 ( 2.0)	13 ( 4.8)	15 ( 6.7)	6 ( 5.6)	9 ( 8.6)
over 12.0	14 ( 5.6)	27 (10.4)	29 (13.00)	19 (17.8)	33 (31.4)
Total	251 (26.7)	269 (28.2)	223 (23.4)	107 (11.2)	105 (11.0)

Table 25

## Total Treatment Time by Sex (N=962)

Hours	Male		Female	
	Frequency	Percent	Frequency	Percent
0	95	11.3	11	9.5
.5 - 2.0	224	26.6	24	20.7
2.5 - 4.0	166	19.7	22	19.0
4.5 - 6.0	87	10.3	2	5.2
6.5 - 8.0	82	9.7	9	7.8
8.5 -10.0	56	6.7	6	5.2
10.5-12.0	35	4.2	13	11.2
12.5-15.0	44	5.2	7	6.0
15.5-20.0	32	3.8	16	13.8
20.5-25.0	14	1.7	2	1.7
25.5-30.0	3	0.4	0	0.0
over 30.0	4	0.5	0	0.0